

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 8

### **REMARKS/ARGUMENTS**

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful.

#### **Status of Claims and Support for Changes in the Claim Listing**

Claims **1-15, 17-23, 25** and **27** were pending in the application.

Claims **1-15, 17-23, 25** and **27** were rejected.

Claims **1, 12, 13, 21, 25** and **27** are currently amended.

Claims **33** and **34** are new.

Therefore claims **1-15, 17-23, 25, 27, 33** and **34** remain pending in the application.

Claims **1, 12, 13, 21, 25** and **27** have been amended so as to remove the limitation that the digital image communication in medicine (DICOM) modality worklist is generated by a hospital information system (HIS) or radiology information system (RIS). This limitation was added to those claims in the first office action reply and has caused the discussion of the application to digress to discussing the merits of this limitation rather than concentrating on more pertinent aspects of the application. By removing the limitation, Applicant desires to focus the discussion of the application to the novelty and innovativeness of the claims, as they would have read had the limitation not been added.

Claims **33** and **34** have been added. Claims **33** and **34** are based on claims **24** and **26** respectively which were cancelled in the first office action reply to save

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 9

on expenses (due to the addition of new claims which have since been cancelled). Claims 33 and 34 also reflect changes made to claims 25 and 27 respectively in previous amendments. Therefore no new matter has been added.

### **Claim Rejections**

In the advisory action, the Examiner rejected the arguments of the Applicant, stating that the combination of Cooke, Jr. et al (US 6,574,629, hereinafter "Cooke") and Bocionek (US 2002/0091765, hereinafter "Bocionek") discloses the limitations required by the claim language.

Applicant appreciates the time and consideration provided by the Examiner in reviewing this application, however, respectfully traverses the rejection of the claims at least for the following reasons.

Applicant respectfully submits that neither Cooke nor Bocionek, singly or in combination, teaches or suggests a digital image communication in medicine (DICOM") modality worklist which is examined so as to ensure that in a faster access part of storage there is available at least some data deemed likely to be accessed in connection to a task scheduled by the worklist, as recited in independent claims **1, 13, 25** and **33**. Applicant also respectfully submits that neither Cooke nor Bocionek, singly or in combination, teaches or suggests the querying of a hospital information system or radiology information system and receiving data related to a task scheduled by a DICOM modality worklist so as to ensure that in a faster access part of storage there is available at least some data deemed likely to be accessed in connection to that scheduled task as recited in independent claims **12, 27** and **34**. Applicant also respectfully submits that neither Cooke nor Bocionek, singly or in combination, teaches or suggests a worklist examiner configured to examine a DICOM modality worklist and determine at least one type of data relating to a task scheduled by the worklist which is likely to be accessed and a retriever configured to transfer or copy data which is of at least

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 10

one of said types and is available only in a slower access part of a storage to a faster access part of a storage, as recited in independent claim 21.

Before Applicant refers to arguments made by the Examiner in the advisory action dated 10/11/2006, Applicant requests to draw the Examiner's attention to document CEN/TC251/WG4 titled Digital Imaging and Communications in Medicine, Supplement 10, submitted with this RCE. As stated in the forward to the DICOM supplement, ACR (American College of Radiology) and NEMA (the National Electrical Manufacturer's Association) developed the DICOM standard. This supplement to the DICOM standard specifies the Basic Worklist Management Service Class which contains the Modality Worklist SOP Class which supports the transfer of the Modality Worklist from the Information System (IS) to the Modality (as stated in the "Scope and Field of Application section, page iv, line 44 to page v line 2). No limitations should be read into the claims or the invention based on the submitted document which is provided in order to show the novelty, inventive step, and usefulness of the invention over the prior art.

First, it should be noted that as written on the cover sheet of the submitted document, the final text of the supplement is dated February 1, 1996, well before the filing date of the current application (2003), Cooke (1998), and Bocioneck (2001).

Although applicant would appreciate the Examiner reading the entire submitted supplement, Applicant would like to direct the Examiner's attention to two short sections in the submitted document.

Refer first to DICOM Modality Worklist Part 4 Addendum page 8 line 36 to page 9, line 27:

**Z.6.1 Modality Worklist SOP Class**

**Z.6.1.1 Modality Worklist SOP Class Overview**

The Modality Worklist SOP class defined within the Basic Worklist Management Service Class defines an application-level class of service which facilitates the

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 11

communication of information to the imaging modality about Scheduled Procedure Steps, and entities related to the Scheduled Procedure Steps. As will be detailed below, part of the information carried by the worklist mechanism is intended to be used by the imaging modality itself, but much of the information is intended to be presented to the modality operator.

This worklist is structured according to Scheduled Procedure Steps. A procedure step is a unit of service in the context of a requested imaging procedure.

The Modality Worklist SOP class supports the following requirements:

- Verify patient (e.g. download patient demographic information from IS to Modality, to verify that the person to be examined is the intended subject).
- Select a Procedure Step from the IS (e.g. download procedure step information from the IS to the Modality). There are two alternatives for the realization of this requirement, supporting different organization methods of the department: The Modality may obtain the list of Procedure Steps from the IS. Display of the list and selection from the list is done at the Modality. The list is displayed and selection is performed on the IS. This implies, that the information is obtained by the Modality just before the Scheduled Procedure Step starts. The Modality Worklist SOP class supports both of the organization methods.
- Select Imaging Procedure.
- Prepare the Imaging Procedure (Step).
- Couple DICOM images unambiguously with related information from the IS (e.g. patient demographics, procedure description, ID data structure from the IS, contextual IS information).
- Capture all the attributes from the IS, that are mandatory to be inserted into the DICOM Image Object

The Modality Worklist SOP Class is not intended to provide access to all IS information and services which may be of interest to a Modality operator or attending physician. Its primary focus is the efficient operation of the image acquisition equipment. DICOM SOP Classes such as the existing Detached Patient Management SOP

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 12

Class and non-DICOM Services which fall beyond the scope of the Modality Worklist SOP Class may be needed.

The Modality Worklist SOP Class does not support the transmission of information from the Modality to the information system.

It is important to note that among the requirements supported by the DICOM Modality Worklist SOP Class quoted above and in the remainder of the submitted supplement, there is no neither a hint nor an indication of providing for prefetching based on the DICOM modality worklist. As stated above, the DICOM Modality Worklist SOP Class is not intended to provide access to all IS information and services since its primary focus is the efficient operation of the image acquisition equipment. One of the useful, innovative and novel features of embodiments of the invention is that it provides for prefetching, when required, based on DICOM modality worklist information which is in any event available due to the DICOM standard but was never before used for prefetching.

Please refer now to table Z.6-2 (Attributes for the Modality Worklist Information Model) on pages 12 through 15 of the DICOM Modality Worklist Part 4 Addendum. It is evident from the table that much useful information is included in the DICOM modality worklist in accordance with the DICOM standard, which can most certainly facilitate prefetching when required as described in embodiments of the current application (although as mentioned above the information was never used before for prefetching).

Although the submitted supplement describing the DICOM modality worklist was available at the time of filing of Cooke and Bocionek, Cooke performs prefetching that is not based on a DICOM modality worklist, even though Cooke uses the DICOM standard in other parts of the system (see Figure 1), and Bocionek does not discuss prefetching at all.

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 13

Cooke describes a smart medical storage management system where HL7 information is transferred from the RIS (i.e. radiology information system). Only the transfer of HL7 information from the RIS 44 to the RIS gateway/PACS broker 46 is illustrated in each figure depicting both RIS 44 and PACS broker/RIS gateway 46. For example, see Figure 1 and Figure 4 of Cooke. See also, for example, column 13, lines 4 to 12 of Cooke (reproduced below) where it is specified that PACS broker 46 communicates in HL-7 with the RIS.

Specifically, PACS broker **46** is a stand-alone platform that listens to the RIS and responds to query/retrieve statements from the PACS core components by accessing appropriate data from the RIS. To this end, PACS broker 46 is able to communicate in HL-7 ("Health Level 7) with the RIS and to communicate in DICOM with network gateway **6**. Thus, the PACS broker makes patient demographics , schedules, study parameters and reports on the RIS available to the core PACS components (underline added).

It is also clearly stated in Cooke that the described pre-fetching is based on information received from RIS 44 which as stated above is HL-7 information. See for example Cooke, column 18, lines 59 to 65:

In more detail, pre-fetching involves RIS gateway 46 receiving information concerning a scheduled event from RIS 44, and then transmitting that information to the PACS, in particular to network gateway 6 (see FIG. 1). The network gateway then queries the RIS, via the RIS gateway, requesting details concerning the scheduled event. (underline added)

See also Cooke, column 3, lines 14-37, where prefetching is further described:

According to another aspect, the PACS pre-fetches images (and/or summaries of information relating to the images) in response to a scheduled event. In this regard, "pre-fetching" refers to the process of automatically (i.e.,

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 14

without user intervention) retrieving images (and/or summaries) before the scheduled event. In this aspect, the PACS includes at least one station capable of displaying the images, and a network gateway which communicates with the station and a remote source (e.g., a hospital radiology information system, or "RIS"). The network gateway receives information concerning the scheduled event from the remote source, queries the remote source for details on the scheduled event, receives the details from the remote source, and retrieves images (and/or summaries) from a memory on the PACS based on the details and one or more predetermined pre-fetching rules. By effecting pre-fetching in this manner, the invention further reduces the amount of time required to review images. That is, because the images and/or summaries have been pre-fetched, they will be ready and waiting for the reviewer (e.g., a physician) at the time of the exam. With regard to the summaries, retrieval of the summaries only is a significant advantage, since it eliminates the need to retrieve an image when only its summary is needed. (underline added)

This quote illustrates a pushing of information to the network gateway, whereas with the DICOM modality worklist there is no pushing of information, further proof that Cooke does not base prefetching on the DICOM modality worklist. See for example the submitted supplement page v, lines 12-16 where it is stated how information is obtained: "This supplement defines a service for communicating such worklists. The following are characteristics for this service class: - The worklist has to be queried by the application entity..."(underline added)

See also table 1 in column 6 of Cooke where the PACS core components are described. The network gateway's role is described as:

Performs DICOM validation and print ("NWG") services, network compression, radiology information system ("RIS") validation, AGFA ® PACS Interface Protocol ("APIP") translation, and workflow automation, including

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 15

routing, pre-fetching of prior relevant patient images, and generation of user-defined demographic overlays.

Note that the term "DICOM" is used to describe the type of validation and print services in this quote from Cooke. However the DICOM standard is omitted when describing prefetching in this quote from Cooke.

It is therefore evident that although Cooke uses the DICOM standard in other parts of the system, Cooke's prefetching is not based on a DICOM modality worklist, even though the submitted supplement describing the DICOM modality worklist was a final text well before the time of the filing of the Cooke application. Since Cooke chose to use the DICOM standard for other parts of his system (see for example figure 1) but to not for prefetching, Cooke in fact teaches away from using the DICOM modality worklist for prefetching.

Applicant also respectfully reiterates what was previously submitted in replies to previous office actions, that the term "worklist" as used by Cooke not only is not a DICOM modality worklist but does not even serve the same function as the DICOM modality worklist of the current invention. For example, Cooke talks about prefetching relevant studies to a reviewing station in column 18, lines 55-59:

The present invention includes the ability to route relevant prior studies to a reviewing station in contemplation of a scheduled event, such as a patient examination or the like. This process is called pre-fetching, and is effected by code executing on the network gateway. (underline added)

Note that Cooke in column 11, lines 53 to 54 specifically equates the worklist with the studies:

The worklist comprises the study, or group of studies, that the user selects from the main study list.

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 16

Therefore in contrast to the current invention where the DICOM modality worklist feature for example ensures that data deemed likely to be accessed in connection to a task scheduled by the worklist is available in a faster access part of storage or enables the copying/transferring of such data to a faster access part of storage, in Cooke it is the relevant worklists which are prefetched. This distinction is proof that not only is the worklist described by Cooke not a DICOM modality worklist but moreover the worklist in Cooke does not even remotely serve the same function as worklist of the invention described in the current application. To further hone the point, there is neither a hint nor an indication that in Cooke a worklist is examined or that data related to a worklist is received so as to ensure that data relating to a task scheduled by the worklist and likely to be accessed is available in a faster access part of storage or so that such data can be copied/transferred to a faster access part of storage.

In Bocionek, the only time a worklist is mentioned is in the following quote:

In addition to these "administrative activities", the RIS often also acts as workflow driver in radiology in order, for example, to send request data in the form of a DICOM worklist entry to a modality such as a CT, MR or X-ray device at which the examination is to take place. Given current systems, the examination data, for example, a number of images, series and radiation protection data such as tube voltage (kV), mAs product (mAs), time (s), energy dose (Gy), etc., must be manually read by a worker and transmitted into the RIS for the required transfer of the examination data from the modality into the RIS for documentation and billing, a considerable outlay and additional sources of error occurs as a result.

It is evident from this quote that in Bocionek the usage of the DICOM modality worklist is in accordance with the submitted supplement 10 to the DICOM standard discussed above. Certainly there is neither a hint nor an

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 17

indication in Bocionek that the mentioned DICOM worklist is examined or that data related to the worklist is received so as to ensure that data relating to a task scheduled by the worklist and likely to be accessed is available in a faster access part of storage or so that such data can be copied/transferred to a faster access part of storage. The remainder of Bocionek mainly deals with electronic mail.

Applicant would like to also directly address the remarks of the Examiner in the advisory action dated 10/11/2006. The Examiner took the position that Applicant had argued that the combination of Cooke and Bocionek does not disclose "examining a Digital Image Communications in Medicine (DICOM) modality worklist, generated by a hospital information system (HIS) or radiology information system (RIS) which schedules at least one modality to perform at least one task". Applicant has removed the clause relating to generation to make clear that Applicant does not believe that the merits of the invention rely on the generation of the DICOM modality worklist. Applicant also agrees with the Examiner that having a DICOM modality worklist which schedules tasks for modalities is well known, as evidenced by the standard supplement currently submitted. Applicant however takes the position that because the DICOM modality worklist is well known due to its being a standard, there is an enhancement of the usefulness of the claimed inventions.

In the second point of argument, the Examiner states that the combination of Cooke and Bocionek discloses "ensuring that in the faster access part there is available at least some data which based on at least one predetermined rule is deemed likely to be accessed in connection to said at least one task to be performed by said at least one modality scheduled by said worklist". Applicant respectfully disagrees. As discussed above in more detail, Bocionek's usage of the DICOM modality worklist is entirely conventional as per the supplement currently submitted and there is certainly no mention of prefetching. Moreover, Cooke chose to use the DICOM standard for other parts of his system (see figure

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 18

1) but not for prefetching, thereby teaching away from using the DICOM modality worklist for prefetching.

Based on the above, applicant respectfully submits that Applicant respectfully submits that neither Cooke nor Bocionek, singly or in combination, teach or suggest independent claims **1, 12, 13, 21, 25, 27, 33 and 34** and that therefore independent claim **1, 12, 13, 21, 25, 27, 33 and 34** are allowable.

Dependent claims **2-11, 14-15 and 17-23**, which depend directly or indirectly from the independent claims therefore include the limitations of the independent claims. Applicant therefore respectfully asserts that the dependent claims are also allowable.

Claims **8-10** were rejected under 35 U.S.C 103(a) as being unpatentable over Cooke, Jr. et al (US 6,574,629) in view of Bocionek (US 2002/0091765) as applied to claim **1** above, and further in view of Sechrest et al (US 6,910,106). Applicant respectfully asserts that as independent claim **1** is allowable, dependent claims **8-10** which depend directly or indirectly on claim **1** are also allowable.

Applicants believe the remarks presented hereinabove to be fully responsive to all of the grounds of rejection raised by the Examiner. In view of these remarks, Applicants respectfully submit that the specification and all of the claims in the present application are in order for allowance. Notice to this effect is hereby requested.

Please charge any fees associated with this paper to deposit account No. 09-0468.

Respectfully submitted,

By: /Stephen C. Kaufman/  
Stephen C. Kaufman  
Reg. No. 29,551  
Phone No. (914) 945-3197

Date: December 4, 2006

APPLICANT: Gal Shachor  
SERIAL NO.: 10/697,183  
FILED: October 30, 2003  
Page 19

IBM Corporation  
Intellectual Property Law Dept.  
P. O. Box 218  
Yorktown Heights, New York 10598